

## ANIMAL RINGWORM IN UPPER EGYPT

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One thousand nine hundred and twenty animals (cattle, buffalo and sheep) and 60 humans suspected of ringworm were investigated in Egypt. Clinical and mycological aspects of the disease are described. *Trichophyton verrucosum* was the commonest dermatophyte on all species examined. Only *T. mentagrophytes* was isolated once from soil in the region of the clinical cases.

Ringworm of animals and man still occupies an eminent position among mycotic diseases. Despite worldwide geographic distribution and its prevalence in tropical and temperate climates, particularly those countries having areas with hot and humid climatic conditions, there are still geographic differences with regard to the endemicity of the etiological agents. It has been noticed that the disease prevails in upper Egypt among farm animals (cattle, buffalo, sheep and goats) in an endemic seasonal form. This investigation was undertaken to define for the first time the etiological agents and to investigate its public health significance.

### MATERIALS AND METHODS

A total of 1920 animals (1290 cattle, 480 buffaloes, 150 ewes) as well as 60 human cases, working on the farms where the animals originated, were examined mycologically. The farms were in three different localities: Assiut, Minia and New Valley in upper Egypt. The affected animals and humans showed skin lesions resembling mycotic infections. Hair and skin scrapings obtained from around the periphery of the lesions were obtained and examined both microscopically, using a mounting fluid containing 5% KOH and 25% glycerin (Beneke & Rogers, 1971), and culturally by inoculating clinical specimens on slants of Sabouraud's glucose-peptone agar containing cyclohemimide and chloramphenicol to restrict the growth of bacteria and fungi other than dermatophytes. The slants were then kept at room temperature (22-24°C) for 6 weeks before discarding them as negative. In addition 12 pooled soil samples were collected from the animal enclosures and examined by the hair bait technique of Vanbreuseghem (1952).

### RESULTS

The direct microscopic examination of most of the skin crusts and hair samples revealed the presence of fungal spores and/or mycelial elements suggesting a dermatomycotic infection. Samples from 1160 cases (58%) proved positive by direct examination. The number of positive cases among cattle was 800 (62%), buffaloes 230

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TABLE 1.—RESULTS OF DIRECT MICROSCOPIC EXAMINATION OF HAIR AND SKIN SCRAPINGS FROM ANIMALS AND MAN.

Host	Direct microscopy	
	Positive	Negative
Cattle	800 (62%)	490
Buffalo	230 (47%)	250
Sheep	110 (73%)	40
Animal Attendants	20 (33%)	40
	1,160 (58%)	820

TABLE 2.—RESULTS OF CULTURAL EXAMINATION.

Host	Cultural Results				
	<i>T. verrucosum</i>	<i>T. mentagrophytes</i>	<i>T. verrucosum</i> + <i>T. mentagrophytes</i>	<i>T. verrucosum</i> + <i>T. rubrum</i>	Negative
Cattle	370 (28%)	0	10 (7%)	0	910
Buffalo	110 (22%)	20 (4%)	0	0	350
Sheep	100 (83%)	0	0	20 (15%)	30
Animal attendants	30 (50%)	0	0	0	30

(47%), sheep 110 (73%) and 20 samples from human cases (33%) as shown in Table 1.

Culturally, 660 (33%) inoculated samples proved positive for dermatophytes. *Trichophyton verrucosum* was most commonly isolated and was recorded in 610 cases representing all host species (Table 2). Other dermatophytes isolated were *T. mentagrophytes* from 20 cases and in mixed culture with *T. verrucosum* from other 10 cases and with *T. rubrum* in a mixed culture from 20 cases.

#### DISCUSSION

Ringworm constitutes a dominant group of the fungal infections of animals. In spite of the fact that it does not present dramatic aspects, it still poses important economic problems, e.g. extensive losses of hides, wool and even meat production. The infected animals, particularly calves, suffered severe emaciation from the substantial itching irritation and associated loss of appetite over a long period of time. The disease tends to be of recurrent nature so that the animals remain affected for several seasons. Besides that, the people coming in direct contact with the diseased animal easily contract the infection in a severe form requiring, in most cases, long periods of therapy (Abou-Gabal & Winkler, 1968).

It is important to diagnose such infections both clinically and mycologically as they may be easily confused with other skin diseases, especially scabies, urticaria, bacterial infections and seborrheic dermatitis. It is noteworthy that the appearance and distribution of lesions varied with the species of animal studied. The main ring-

worm lesions in cattle were mostly confined to the head, neck, chest and buttock areas. They were elevated, indurated, well defined, circular, greyish and crusty with a tendency to spread from the primary sites of infection. In buffaloes the lesions were mainly on the neck, chest and back. They were poorly defined, mildly encrusted and mostly alopecic. In a few instances only erythematous, nodular areas were present. The lesions on sheep were similar to those described in cattle but were confined to the head. Ringworm lesions observed on humans were circinate, erythematous, papulo-squamous and studded with crusting vesicles and pustules varying in size from 0.5-5 cm and localized mainly on the face and lower arm.

That the culture technique is also necessary and reliable as a complementary aid to the direct microscopic examination procedure is proven by the fact that many of the cases recorded as negative using the direct microscopic examination proved to be positive culturally. The fact that dermatophytes were isolated from only 33% of the samples examined could be attributed to many factors among which is that samples may not have been taken from the active border of the lesions where the invading fungal elements are expected to be found. It may also have been due to the fungicidal activity of previously applied topical substances.

Our results support the view that *T. verrucosum* is a highly specialized animal dermatophyte and constitutes the main etiologic agent of ringworm in the species examined. It was obtained in pure culture from 370 cases and in a mixed culture with *T. mentagrophytes* from 10 other cases of ringworm infections among cattle. In buffalo, it was isolated 110 times in pure culture and in 20 cases associated with *T. mentagrophytes* whereas it was isolated from 100 sheep and in association with *T. rubrum* in 20 cases. *T. verrucosum* constituted the sole etiological agent among the examined human cases as it was isolated 30 times in pure cultures. *T. verrucosum* was not isolated from soil samples; only *T. mentagrophytes* was isolated.

In our investigation, the number of the infected human cases coming in direct contact with the diseased animals reached 25% of the whole personnel in the farms examined. In our opinion, this incidence does not represent the actual number, as many of the personnel joining such farms are working temporarily and we assume a higher number of human infections in the involved areas, especially if the indirect contact and airborne methods of infection are involved. It is of particular interest to mention that spores of *T. verrucosum* can remain viable for months to years in hair and skin crusts shed from the infected animals in the environment (Götz, 1962, Abou-Gabal, 1970, Abou-Gabal & Abd Elrehim, 1974), and the significance of these viable spores and the asymptomatic animal carrier has been assessed fully in terms of their potential danger to man (Walker, 1955, Kaben, 1967).

#### ZUSSAMENFASSUNG

1920 Tiere (Rinder, Büffel und Schafe) und 60 Menschen, die auf eine Dermatomykose verdächtig waren, wurden in Ägypten untersucht.

Die klinischen und mykologischen Gesichtspunkte der Krankheit wurden beschrieben. Von allen gefundenen Arten war das *Trichophyton verrucosum* der häufigste Dermatophyt. In den Gebieten, in denen die klinischen Fälle vorkamen, wurde uns das *T. mentagrophytes* 1 mal aus Erdproben isoliert.

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